



Software Design

# SG Automation Output Protocol

## Revision 157

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# 1.0 Introduction

This specification describes protocols for the interface between signal processing computers and the Sur-Gard receivers to report alarms to the central station computer via a TCP/IP or an RS-232 port. In all cases the Sur-Gard receiver is the master (originator) of packets.

## 1.1 Port Configurations

The Sur-Gard MLR2, SLR, and MLR2E receivers use a default configuration of 1200 baud rate, one start bit, seven data bits, one even parity bit, and one stop bit structure, to transmit and receive signals on the RS-232 port. This protocol can be programmed on the receiver by the central station operator to enable different configurations. The data contained in the TCP/IP protocol is identical.

The Sur-Gard MLR2000, System-II and System-III receivers use a default configuration of 9600 baud rate, one start bit, eight data bits, no parity bit, and two stop bits structure, to transmit and receive signals on the RS-232 port. This protocol can be programmed on the receiver by the central station operator to enable different configurations.

For receivers that can output on TCP/IP or USB the data protocol is identical.

For more details refer to the [Detailed Description of the COM Ports](#) section in this document.

## 1.2 General Receiver Outgoing Packet Structure

All packets originating from the receiver shall be in the following Structure.

Field	Protocol ID	RRLLL	Data	Terminator
Number of bytes	1	variable*	variable	1
Example	S	01002	[#1234 NBA01]	0x14 ([DC4])

The first byte is always the Protocol ID which defines the structure and length of the Data fields. All packets will contain the terminating [DC4] byte.

\*The RRLLL (Receiver and Line Number) typically by default represent the physical receiver and linecard number. On the MLR2, SLR, and PCLC2 this field is fixed as RRL. MLR2E, System III and MLR2000 the length of this field can be changed through options, the default is 5 bytes RRLLL. See also the [RRLLL to DNIS](#) section.

## 1.3 General Automation Incoming Packet Structure

The normal response that all SG receivers expect in response to an outgoing packet is a single byte ACK (0x06).

Field	Type	Data
Number of Bytes	1	Variable (typically none)
Example	0x06	

For all possible Automation replies see also the [Automation Responses](#) section.

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## 1.4 B32 Headers

The MLR2000 and System III receivers contain an option to add 4 additional bytes to all packets. The default for this option is disabled.

1. B32 Headers apply only to TCP/IP automation messages, not serial messages or printer messages.
2. When enabled ALL outgoing and incoming automation messages will contain 4 extra bytes at the start of each packet.

These four bytes are: 00 00 LL LL

where LL LL = is the BCD value of the size of the entire packet..

ie.. if the original length was 1B HEX bytes to be sent, the packet would be:

00 00 00 31 <original packet>

and the ACK back to the receiver will be:

00 00 00 05 06

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## 2.0 Communication Formats Summary

The below table has organized the communication formats and which protocol identifier should be expected. Refer to the appropriate receiver installation manual for which formats that are supported by which receiver.

Format	Category	Protocol Identifier
Acron	3/8, 4/8	9
Adcor	3/2	1
Ademco Contact ID	4/2/1/3/2/3CHK	5
Ademco Express	4/1, 4/2	1
Ademco High Speed	4/8/1, 3/8/1	8
Ademco Slow	3/1, 3/2, 4/1, 4/2,3/1, 4/1 Partial EXT, 3/1, 4/1 EXT, 3/1, 4/2 CHK, 3/1 EXT CHK	1
Audio	1600hz	1
BFSK	3/2	6
CESA	5/3	G
Contact ID	4/2/1/3/2/3CHK	5
DMP 1	Modem	P
DMP 3	Modem	P
DVACS	SIA Protocol 1	3
Internal / Receiver Status Messages	N/A	0 or S
FBI Superfast	4/3/1	J
Franklin/Sescoa	3/1, 3/2, 4/1, 4/2 3/1, 4/1 EXT 3/1, 4/1 partial EXT 3/1, 4/2 CHK 3/1 EXT CHK	1
ITI	CARETAKER_PLUS, COMMANDERIII, RF_COMMANDER, CARETAKER_PLUS, SX_V, COMMANDER_2000, SX-IVB	I
Modem II	Modem	1, R or 6
Modem II A	Modem	R or 6
Modem II B	Modem	R or 6
Modem IIE	Modem (updated to decode 6 – 10 digit account )	R or 6
Modem III A <sup>2</sup>	Modem (updated to decode 6 – 10 digit account)	R or 6
Outel	2/2	L
Pulse	4/2 EXT Special	1
Pulse	3/2, 4/2	1
Radionics HEX	3/1, 3/2, 4/1, 4/2 3/1, 4/1 EXT 3/1, 4/2 CHK 3/1, 4/1 partial EXT 3/1 EXT CHK	1
Robofon	6/3	H
Scantronics	2/8/1, 5/8/1, 6/8/1, 2/16/1, 3/16/1, 4/16/1, 5/16/1, 6/16/1	8 or 1
Sescoa Superspeed	Pulse 4/3	7
SG 4/2	4/2	1
SG 4/3	4/3 4/3 CHK	1
SIA	SIA	3
SIA	SIA Level 1, Level 2, Level 3.	S
SIA 8/20	SIA	S

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Format	Category	Protocol Identifier
SK FSK1	4/1	E
SK FSK2	4/2	F or C
Surtec	8/2	Y
Telim/Telenot	6/3	T
VARITECH	4/1, 4/2	I
Vonk	2/16	V
Westec Format 1	DTMF	W
Westec Format 2	DTMF	W
Westec Format 3	DTMF	W
Westec Format 5	DTMF	W
Westec Format 6	DTMF	W

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## 3.0 Protocol ID Summary

The following table indicates which receiver supports/outputs which Protocol ID, note, however that some outputs may require a different configurations or options to cause the output to occur.

Protocol ID	Format / Protocol Name	PCLC2	SLR	MLR2	MLR2E	S-II	S-III	MLR2000
0	Internal receiver generated				√	√	√	√
1	Standard	√	√	√	√		√	√
2	Reserved (Downlook)			√				
3	SIA Protocol 1		√	√		√	√	
4	Caller ID	√	√	√	√		√	√
5	Contact ID	√	√	√	√	√	√	√
6	Modem II, BFSK	√	√	√	√		√	√
7	Sescoa Super Speed	√	√	√	√		√	√
8	Ademco High Speed / Scantronics	√	√	√	√		√	√
9	Acron	√	√	√	√		√	√
A	911 Emergency			√				
B	BFSK			√			√	
C	SK FSK2			√	√		√	√
D	Downlook			√				
E	SK FSK1			√	√		√	√
F	SK FSK2			√	√		√	√
G	CESA			√			√	
H	Robofon			√			√	
I	ITI			√	√		√	√
J	FBI		√	√	√		√	√
K	Scancom E433			√				
L	Outel			√			√	
M	Currently not in use							
N	Stratel							
O	Currently not in use							
P	DMP				√		√	√
Q	10-digit account Contact ID				√		√	√
R	Modem II SIA				√		√	√
S	SIA Protocol 2	√	√	√	√	√	√	√
T	Telenot			√				
U	International Caller ID			√	√		√	√
V	Vonk			√			√	
W	Westec				√		√	√
X	Currently not in use							
Y	Surtec				√		√	√
Z	Reserved for internal use only							
e	ADT pulse extended							√
u	Calling Name				√		√	√
s	SIM Number Protocol					√	√	

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## 4.0 Data Structure Definitions

### 4.1 Internal Status Messages for: MLR2000, System III, MLR2E and System Receivers (0)

0RRLLL[#AAAA|NYYZZZZ][DC4]

0 : Protocol number. (note that this is programmable and may be changed to 'S').  
 RR : Virtual Receiver number.  
 LLL : Virtual Line number.  
 s : Space Character.  
 AAAA : Account Code: generally 0000.  
 YY : SIA Event Code.  
 ZZZZ : Typically Slot and Shelf number, zone or event identification number (SIA Event dependant).  
 [DC4] : Terminator, 14 Hex.

In the below sections:

MLR2000 = CPM2000 Internal status messages + Linecard (DRL2000) internal status messages.

System III = CPM3 Internal status messages + Linecard (DRL3 and/or DRL3-IP) internal status messages.

MLR2E = CPM2 Internal status messages + Linecard (DRL2E) internal status messages.

System II = System II Internal status message + Linecard (DRL3-IP) internal status messages.

#### Status Addressing

The Line card status will be reported via physical addressing. The line cards are assigned by shelf and slot number. All device status information is in Sur-Gard format. The below messages will denote **ssoo** to indicate the physical shelf and slot number. For example 020B would indicate shelf 02 and slot 0B. The reporting of status can be on the automation output, CPM display and printer will relate to physical addressing. Physical addressing was chosen to facilitate maintainance, error outputs include the physical address to assist in maintainance.

#### 4.1.1 CPM2000 Internal Status Messages

0RRLLL[#0000|NYYZZZZ]: RR is the receiver number of the CPM2000, and LLL will be 000 to signify a CPM2000 event.

**Note:** All CPM3 printer message with a corresponding automation output will contain the SIA automation event in the output.

Ex. 22 Jan 2007 11:04:50 - 22 Jan 2007-11:04:48-01/02-SG -01-000-0000-NYD0102-Line Card Absent

22 Jan 2007 11:05:29 - 22 Jan 2007-11:05:28-01/02-SG -01-000-0000-NYE0102-Line Card Restored

Description	Printer Message	Automation message (YYZZZZ)	LCD Message	LCD Priority
24V Battery Low	24V Battery Low	YT0000	24V LowBatt	7
24V Battery Restored	24V Battery Restored	YR0000	*	*
5V Failure	5V Failure	YT0001	5V Failure	8
5V Restored	5V Restored	YR0001	*	*
Fan Circuit Failure	Fan Circuit Failure	YX0000	Fan Failed	9
Fan Circuit Restored	Fan Circuit Restored	YZ0000	*	*
Line Card Absent	Line Card Absent	YDssoo		
Line Card Restored	Line Card Restored	YEssoo		
Operator activity mode.	Programming Entered	LB0000	N/A	N/A

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Primary CPM2000 Failure.	Primary CPM2000 Failure	YX0001	N/A	N/A
Printer #1 Error	Printer#1 Error	VZ0001	Printer#1 Error	1
Printer #1 Restored	Printer#1 Restored	VY0001	*	*
Printer #2 Error	Printer#2 Error	VZ0002	Printer#2 Error	2
Printer #2 Restored	Printer#2 Restored	VY0002	*	*
Printer #x Error	Printer#x Error	VZ000x	Printer#x Error	3
Printer #x Restored	Printer#x Restored	VY000x	*	*
PSU2000 AC Source A Failure	PSU-AC A Fail	AT0000	AC A Fail	4
PSU2000 AC Source A Restored	PSU-AC A Restored	AR0000	*	*
PSU2000 AC Source B Failure	PSU-AC B Fail	AT0001	AC B Fail	5
PSU2000 AC Source B Restored	PSU-AC B Restored	AR0001	*	*
PSU2000 DC Source A Failure	PSU-DC A Fail	YP0003	DC A Fail	6
PSU2000 DC Source A Restore	PSU-DC A Restore	YR0003	*	*
PSU2000 DC Source B Failure	PSU-DC B Fail	YP0004	DC B Fail	6
PSU2000 DC Source B Restore	PSU-DC B Restore	YR0004	*	*
Secondary CPM2000 Failure	Secondary CPM2000 Failure	YZ0002	N/A	N/A
Serial Port #1 not responding.	COM#1 Absent.	YC0001	COM#1 Absent	10
Serial Port #1 responded ACK	COM#1 Restored	YK0001	*	*
Serial Port #2 not responding	COM#2 Absent.	YC0002	COM#2 Absent	11
Serial Port #2 started polling	COM#2 Restored	YK0002	*	*
TCP/IP Printer error	TCP/IP Printer Error	VZ0000	N/A	N/A
TCP/IP Printer Restored	TCP/IP Printer Restored	VY0000	*	*
TCP/IP Socket 1026 Failed	ADT-TCP/IP Failed	NT1026	N/A	N/A
TCP/IP Socket 1026 Restored	ADT-TCP/IP Restored	NR1026	N/A	N/A
TCP/IP Socket 1025 Failed	ADT-TCP/IP Failed	NT1025	N/A	N/A
TCP/IP Socket 1025 Restored	SG -TCP/IP Restored	NR1025	N/A	N/A
UPS AC Fail (PGM)	UPS AC Fail	AT0002	N/A	N/A
UPS AC Restored	UPS AC Restored	AR0002	N/A	N/A
UPS Low Battery Restore	UPS Low Battery Restore	YR0002	N/A	N/A
UPS Low Battery.	UPS Low Battery.	YT0002	N/A	N/A

## 4.1.2 CPM3 Internal Status Messages

0RRLLL[#0000|NYYZZZZ]: RR is the receiver number of the CPM3, and LLL will be 000 to signify a CPM3 event, ss is the shelf number, oo is the slot number.

**Note:** All CPM3 printer message with a corresponding automation output will contain the SIA automation event in the output.

Ex. 22 Jan 2007 10:54:51 - 22 Jan 2007-10:54:50-00/00-SG -01-000-0000-NYP0100-DCA 1 Failed

22 Jan 2007 10:55:27 - 22 Jan 2007-10:55:25-00/00-SG -01-000-0000-NYR0100-DCA 1 Restored

### CPM3 Internal Status Messages:

Description	Printer Message	Automation Message (YYZZZZ)	LCD Message
Shelf 1 PSU3 Failure	PSU 1 Failed	AT0000	PSU 1 FAIL
Shelf 1 PSU3 Restoral	PSU 1 Restored	AR0000	N/A
Shelf 2 PSU3 Failure	PSU 2 Failed	AT0001	PSU 2 FAIL
Shelf 2 PSU3 Restoral	PSU 2 Restored	AR0001	N/A
Shelf 1 PSC Failure	PSC 1 Failed	AT0002	PSC 1 FAIL
Shelf 1 PSC Restoral	PSC 1 Restored	AR0002	N/A
Shelf 2 PSC Failure	PSC 2 Failed	AT0003	PSC 2 FAIL
Shelf 2 PSC Restoral	PSC 2 Restored	AR0004	N/A
PSU3 Inter-Connect Cable Failure	PSU Cable Failed	AT0100	PSU CABLE FAIL
PSU3 Inter-Connect Cable Restoral	PSU Cable Restored	AR0100	N/A
DC/DC3 A Shelf 1 Failure	DCA 1 Failed	YP0100	DCA 1 FAIL
DC/DC3 A Shelf 1 Restoral	DCA 1 Restored	YR0100	N/A
DC/DC3 B Shelf 1 Failure	DCB 1 Failed	YP0101	DCB 1 FAIL

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DC/DC3 B Shelf 1 Restoral	DCB 1 Restored	YR0101	N/A
DC/DC3 A Shelf 2 Failure	DCA 2 Failed	YP0200	DCA 2 FAIL
DC/DC3 A Shelf 2 Restoral	DCA 2 Restored	YR0200	N/A
DC/DC3 B Shelf 2 Failure	DCB 2 Failed	YP0201	DCB 2 FAIL
DC/DC3 B Shelf 2 Restoral	DCB 2 Restored	YR0201	N/A
Battery Low Shelf 1	12V Battery 1 Low	YT0100	BATTERY 1 LOW
Battery Low Restoral 1	12V Battery 1 Restored	YR0100	N/A
Battery Low Shelf 2	12V Battery 2 Low	YT0200	BATTERY 2 LOW
Battery Low Restoral 2	12V Battery 2 Restored	YR0200	N/A
Fan Circuit Shelf 1 Failure	Fan Circuit 1 Failed	YX0100	FAN 1 FAIL
Fan Circuit Shelf 1 Restoral	Fan Circuit 1 Restored	YZ0100	N/A
Fan Circuit Shelf 2 Failure	Fan Circuit 2 Failed	YX0200	FAN 2 FAIL
Fan Circuit Shelf 2 Restoral	Fan Circuit 2 Restored	YZ0200	N/A
TCP/IP Shelf 1 Printer Failure	TCP/IP 1 Printer Failed	VZ0100	TCP 1 PRINTER FAIL
TCP/IP Shelf 1 Printer Restoral	TCP/IP 1 Printer Restored	VY0100	N/A
TCP/IP Shelf 2 Printer Failure	TCP/IP 2 Printer Failed	VZ0200	TCP 2 PRINTER FAIL
TCP/IP Shelf 2 Printer Restoral	TCP/IP 2 Printer Restored	VY0200	N/A
Parallel Shelf 1 Printer Failure	Parallel 1 Printer Failed	VZ0101	PAR 1 PRINTER FAIL
Parallel Shelf 1 Printer Restoral	Parallel 1 Printer Restored	VY0101	N/A
Parallel Shelf 2 Printer Failure	Parallel 2 Printer Failed	VZ0201	PAR 2 PRINTER FAIL
Parallel Shelf 2 Printer Restoral	Parallel 2 Printer Restored	VY0201	N/A
Serial Shelf 1 Printer Failure	Serial 1 Printer Failed	VZ0102	SER 1 PRINTER FAIL
Serial Shelf 1 Printer Restoral	Serial 1 Printer Restored	VY0102	N/A
Serial Shelf 2 Printer Failure	Serial 2 Printer Failed	VZ0202	SER 2 PRINTER FAIL
Serial Shelf 2 Printer Restoral	Serial 2 Printer Restored	VY0202	N/A
SG-TCP/IP Shelf 1 Failure	SG-TCP/IP 1 Failed	NT0100	SG-TCP/IP 1 FAIL
SG-TCP/IP Shelf 1 Restoral	SG-TCP/IP 1 Restored	NR0100	N/A
SG-TCP/IP Shelf 2 Failure	SG-TCP/IP 2 Failed	NT0200	SG-TCP/IP 2 FAIL
SG-TCP/IP Shelf 2 Restoral	SG-TCP/IP 2 Restored	NR0200	N/A
SG-Serial Shelf 1 Failure	SG-SERIAL 1 Failed	YC0101	SG-SERIAL 1 FAIL
SG-Serial Shelf 1 Restoral	SG-SERIAL 1 Restored	YK0101	N/A
SG-Serial Shelf 2 Failure	SG-SERIAL 2 Failed	YC0201	SG-SERIAL 2 FAIL
SG-Serial Shelf 2 Restoral	SG-SERIAL 2 Restored	YK0201	N/A
Switch Into Active Mode	Taking Over Polling	SC0001	N/A
Switch To Manual Mode	Switching To Manual Mode	SC0000	MANUAL
Switch To Normal Mode	Switching To Normal Mode	SC0003	ACTIVE
Switch To Standby Mode	Switching To Standby Mode	SC0002	STANDBY
Line Card Absent	Line Card Absent	YDssoo	N/A
Line Card Restored	Line Card Restored	YEssoo	N/A
Internal Communication Error (Computer)	Computer: Inter-Comm Error	YOssoo	N/A
Internal Communication Error (Printer)	Printer: Inter-Comm Error	YOssoo	N/A
Internal Communication Error (Console)(Not implement yet)	Console: Inter-Comm Error	YOssoo	N/A
Operator Activity Mode	User:## entered Programming	LB00##	N/A
Primary CPM3 Power Up	Primary CPM3 Power Up	RR0001	N/A
Secondary CPM3 Power Up	Secondary CPM3 Power Up	RR0002	N/A
Primary CPM3 Failure	Primary CPM3 Failure	YX0001	N/A
Primary CPM3 Restoral	Primary CPM3 Restored	RR0001	N/A
Secondary CPM3 Failure	Secondary CPM3 Failure	YX0002	N/A
Secondary CPM3 Restoral	Secondary CPM3 Restored	RR0002	N/A
AHS Database Full	CPM3 AHS Database Full	N/A	N/A
Shelf 1 UPS AC Fail (PGM In)	UPS AC 1 Failed	AT0102	UPS AC 1 FAIL
Shelf 1 UPS AC Restored	UPS AC 1 Restored	AR0102	N/A
Shelf 1 UPS Low Battery Restore	UPS Battery 1 Restored	YR0102	N/A

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Shelf 1 UPS Low Battery	UPS Battery 1 Low	YT0102	UPS BATT 1 LOW
Shelf 2 UPS AC Fail (PGM In)	UPS AC 2 Failed	AT0202	UPS AC 2 FAIL
Shelf 2 UPS AC Restored	UPS AC 2 Restored	AR0202	N/A
Shelf 2 UPS Low Battery Restore	UPS Battery 2 Restored	YR0202	N/A
Shelf 2 UPS Low Battery (PGM in)	UPS Battery 2 Low	YT0202	UPS BATT 2 LOW
Console Session Denied CPM3 Primary	Primary Console Session Denied	RD0001	N/A
Console Session Denied CPM3 Secondary	Secondary Console Session Denied	RD0002	N/A
Reset SG-Fallback	Reset SG-Fallback Initiated	YY0000	N/A
Option Change	Option Change	LS010s	N/A
Automation Time & Date Update	Time&Date Update Fail	RU0000	N/A

### 4.1.3 Linecard (DRL2E, DRL3, DRL2000) Internal Status Messages

ORRLLL[#0000|NYYssoo]: RR is the receiver number, and LLL is the linecard number, ss is the shelf number, oo is the slot number.

Description	Printer Message	Automation Message (YYZZZZ)
Call was blocked (not answered by linecard)	BLOCKED CALL	ABLOCKEDCALL <DNIS> <ANI> *note1
Panel attempted to communicate to the linecard but data was not valid.	INVALID REPORT	YNssoo
Call could not be processed because of bad DNIS structure or no response by the panel.	COMMUNICATION FAIL	YCssoo
Phone line trouble.	PHONE LINE TROUBLE	LTssoo
Phone line restore.	PHONE LINE RETORE	LRssoo
DSP fault	DSP FAULT	YFssoo
Communication on-line timeout	DRL ON-LINE TIMEOUT	YSssoo
Automation Alarm Dropped	Internal Communication Error	RTssoo
Printer Alarm Dropped	Internal Communication Error	N/A
Checksum Fail	Checksum Failed	YFssoo
Line Card Busy	LC Programming	YBssoo
Computer Buffer Full	Computer Buffer Full	YBssoo
Printer Buffer Full	Printer Buffer Full	YBssoo
Ethernet Switch to Primary(DRL2000)	Ethernet Switch to Primary	N/A
Ethernet Switch to Auxiliary(DRL2000)	Ethernet Switch to Auxiliary	N/A
Option Change	Option Change	LSssoo
Two Way Audio Initiated	AUDIO INITIATED	LFssoo *note2
Two Way Audio Cancelled	AUDIO CANCELLED	N/A *note2
Cold boot was performed (debug or buttons)	COLDBOOT	N/A
CPM3 initiated - DRL3 only.	Coldboot by CPM3	N/A

\*note1 The blocked call event is not sent as in form NYYZZZZ but ABLOCKED....

\*note2 This message will contain the account code of the panel that initiated the two way audio session not 0000.

### 4.1.4 Linecard (DRL3-IP) Internal Status Messages

ORRLLL[#000000|NYYzzz...]: RR is the receiver number, and LLL is the linecard number.

Note: the account code may optionally be 4 digits: 0000.

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Description	Printer Message	Automation Message
Network Present	Network Restoral	[#000000 NNR*10.0.0.2*]
Network Absent	Network Failure	[#000000 NNT*10.0.0.2*]
Transmitter Restoral	*Transmitter Restoral 10.0.0.1*	[#123456 NYK*10.0.0.1*]
Transmitter Failure	*Transmitter Failure 10.0.0.1*	[#123456 NYC*10.0.0.1*]
Transmitter Swap	*Transmitter Swap 10.0.0.1*	[#123456 NYS*10.0.0.1*]
Transmitter Unencrypted	*Transmitter Unencrypted 10.0.0.1*	[#123456 NNC*10.0.0.1*]
Invalid Report	* Invalid Report/Possible Compromise 10.0.0.1*	[#123456 NYN*10.0.0.1*]
Accounts Exceeded	*Accounts Exceeded 10.0.0.1*	[#123456 NJO*10.0.0.1*]
Transmitter Deleted	*Transmitter Deleted 10.0.0.1*	[#123456 NJX*10.0.0.1*]
Option Change	Option Change	[#000000 NLS0101]
Console Lead In	Console Lead In	[#000000 NRB*10.0.0.3*]
Console Lead Out	Console Lead Out	[#000000 NRS*10.0.0.3*]
Console Session Denied	Console Session Denied	[#000000 NRD*10.0.0.3*]
Printer Buffer Full	Printer Buffer Full	[#000000 NYB0001]
Computer Buffer Full	Computer Buffer Full	[#000000 NYB0002]
Internal Communications Error (Printer)	Printer: Internal Communication Error	[#000000 NRT0001]
Internal Communications Error (Computer)	Computer: Internal Communication Error	[#000000 NRT0002]
Line Card Programming	LC Programming	[#000000 NYB0101]
LC Remote Reset	Remote Reset	[#000000 NRN0101]
LC Checksum Fail	Checksum Failed	[#000000 NYF0101]
Unknown Account	*Unknown Account 10.0.0.1*	[#123456 NXA*10.0.0.1*]

#### 4.1.5 System-II Internal Status Messages

Description/Event	Automation Message	Printer Message
TCP/IP Printer Failure	VZ0100	TCP/IP Printer Failed
TCP/IP Printer Restoral	VY0100	TCP/IP Printer Restored
Parallel Printer Failure	VZ0101	Parallel Printer Failed
Parallel Printer Restoral	VY0101	Parallel Printer Restored
USB Printer Failure	VZ0103	USB Printer Failed
USB Printer Restoral	VY0103	USB Printer Restored
SG-TCP/IP Automation Failure	NT0100	SG-TCP/IP Failed
SG-TCP/IP Automation Restoral	NR0100	SG-TCP/IP Restored
Serial Automation Failure	YC0101	SG-SERIAL Failed
Serial Automation Restoral	YK0101	SG-SERIAL Restored
USB Automation Failure	NT0102	SG-USB Failed
USB Automation Restoral	NR0102	SG-USB Restored
Switch To Active Mode	SC0003	Switching to Normal Mode
Switch To Manual Mode	SC0000	Switching To Manual Mode
Switch To Standby Mode	N/A	Switching To Standby Mode
Line Card Absent	YDssoo	Line Card Absent
Line Card Restored	YEssoo	Line Card Restored
Internal Comm Error (Computer)	YOssoo	Computer: Inter-Comm. Error
Internal Comm Error (Printer)	YOssoo	Printer: Inter-Comm. Error
Internal Comm Error (Console)	YOssoo	Console: Inter-Comm. Error
Operator Activity Mode	LB00##	User:## Entered Programming
SG-System II Power Up	RR0001	SG-SYSTEM II Power Up
SG-System II Failure	YX0001	Primary CPM3 Failure
Primary CPM3 Restoral	RR0001	Primary CPM3 Restored
UPS AC Fail (PGM In)	AT0102	UPS AC Failed
UPS AC Restored	AR0102	UPS AC Restored
UPS Low Battery Restore	YR0102	UPS Battery Restored

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UPS Low Battery	YT0102	UPS Battery Low
Console Session Denied	RD0001	Primary Console Session Denied
Receiver Busy	YBssoo	LC Programming
Automation Time & Date Failure	RU0000	Time & Date Update Failed
Reset SG-Fallback sent from Console	YY0000	Reset SG-Fallback Initiated

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## 4.2 Supervisory Heartbeat Signal Protocol (1)

1RR000ssssssssss@ssss[DC4]

RR : Receiver number (Real programmed number, never virtual).  
Where, s : Space Character.  
@ : Supervisory Signal.  
[DC4] : Terminator, 14 Hex.

This signal is used to supervise the communication between the receiver and the automation. It is sent to the automation about every 30 seconds, programmable on the receiver. The automation shall acknowledge this signal with an [ACK].

## 4.3 Basic Signal Protocol (1)

1RRLlLssssAAAAAsXGYYY[DC4]

Where, 1 : Protocol number.  
RR : Virtual Receiver number.  
LLL : Virtual Line number.  
s : Space Character.  
AAAAAA : Account Code, usually 4 digits with 2 leading spaces.  
X : Event Code. See Table below.  
G : O/C by Area Number (1-F), or Space.  
YYY : Alarm Code, Zone Number and/or User Number.  
[DC4] : Terminator, 14 Hex.

### RECOMMENDED EVENT CODE TABLE FOR SG 4/3 FORMAT

0	Automatic Test	*
1	Fire Alarm	*
2	Panic Alarm	*
3	Burglary Alarm	*
4	Arming by User #	*
5	Disarming by User #	*
6	Service	*
7	Medical Emergency	*
8	Message	*
9	Restore	*
A	Alarm	
B	Bypass	
C	Arming by User #	
F	Cancel	
H	Unbypass	
O	Disarming by User #	
R	Restore	
T	Trouble	
Z	Common Event Code	
20H	Common Event Code "Space" Character	

\* These event codes are used in the Sur-Gard DTMF 4-3 format.

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The "Space" Character (20 Hexadecimal) can be used in case the automation software package combines the event code with the zone code, conflicting with the existing account code data base.

#### Example 1 (3/1 format):

Panel sends 123 1  
Automation output:  
1RRLLlssssss123sAsss1[DC4]

#### Example 2 (4/2 format):

Panel sends 1234 E2  
Automation output:  
1RRLLlssssss1234sRsSE2[DC4]

#### Example 3 (4/3 format Open/Close)

When the O/C signals are transmitted by Groups with the user number included, the "G" code, currently from 1-F, will be in effect to show the Group number, including the proceeding Event Code O or C, as well as the User number at the "YYY" position. The automation may then redirect this signal when necessary.

Example: The panel 0012 is partially armed on Group #1 and Group #2 by user #134. The Sur-Gard receiver will send the following messages to the automation:

1RRLLlssssss0012sC1134[DC4]  
1RRLLlssssss0012sC2134[DC4]

The automation software could probably redirect these signals to a programmable sub-account, in which an o/c schedule for users can be available.

The user report codes on the Sur-Gard receiver can be decimal or hexadecimal digits.

## 4.4 Internal Status Messages (CPM2) (1)

1RRlssssss0000sXssYY[DC4]

Where, 1 : Protocol number.  
RR : Virtual Receiver number.  
L : Virtual Line number.  
s : Space Character.  
0000 : Account Code  
X : Event Code. See Table below.  
YY : Internal Event Number.  
[DC4] : Terminator, 14 Hex.

Automation Message	Description
0000 A 00	Indicates Operator activity for C or ESC mode
0000 A 01	Printer Error
0000 R 02	Printer Restored
0000 A 03	12V Battery Low
0000 R 04	12V Battery Restored
0000 A 05	COM#1 Absent
0000 R 06	COM#1 Restored
0000 A 07	UPS Low Battery

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0000 R 08	UPS Low Batt Restr
0000 A 11	9V Batt. Low
0000 R 12	9V Batt. Restr
0000 A 13	COM#2 Absent
0000 R 14	COM#2 Restored
0000 A 15	AC Failure
0000 R 16	AC Restored
0000 A 17	UPS AC Fail
0000 R 18	UPS AC Restored
0000 T 19	CPM2 Master Fail
0000 A D0	CPM2 Reset
0000 A F1 to FE	Line Card 01 to 0E Absent
0000 A E1 to EE	Line Card 01 to 0E Restored

## 4.5 Internal Messages (DRL2A, SLR, PCLC2) (1)

1RRLssssss0000sXssYY[DC4]

Where, 1	: Protocol number.
RR	: Receiver number.
L	: Line number.
s	: Space Character.
0000	: Internal status Account Code.
X	: Event Code.
YY	: Internal Event Number.
[DC4]	: Terminator, 14 Hex.

Automation Message	Description
0000 T 10	Faulty Data Received on Line Card
0000 A 20	Telephone Line Fault on Line Card
0000 R 30	Telephone Line Restored on Line Card
0000 T 40	Faulty Call; no data received on Line Card
0000 P 0X	Audio on line X
0000 A D1 to DE	Line Card 01 to 0E Reset

### Example 1:

If line 04 received a two-way voice call, the receiver will send the following output at the end of the call. (even when multiple alarms are sent)

1RRLssssss0000sPss04[DC4]

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## 4.6 ADT Pulse Extended Protocol (e)

**eRRLLlLsssssssEEEEEEEE[DC4]**

Where, e : Protocol ID.  
RR : Virtual Receiver number.  
LLL : Virtual Line number.  
s : Space Character.  
EEEEEEEE : 7 or 9 digits of data. If less than 9, trailing spaces.  
[DC4] : Terminator, 14 Hex.

## 4.7 SIA Protocol (S)

**SRRLlL[#AAAAAA|EMMZzzz/MMzzzz/MMzzzz][DC4]**

Where, S : SIA protocol 2 identifier.  
RR : Virtual Receiver number.  
LLL : Virtual Line number.  
[ : Beginning Data Delimiter.  
# : Account ID Block Code.  
AAAAAA : Account ID, maximum six digits.  
| : Field Separator.  
E : Function Block Code.  
MM : Event Code or Modifier.  
zzzz : Zone Code, User Code, Door or Relay.  
/ : Data Code Packet Separator.  
] : Ending Data Delimiter.  
[DC4] : Terminator 14 hex.

The length of the signal is varying, and it can support the maximum 66-byte data block transmission from the control panel. When this optional protocol is selected, all SIA information will be sent to the host automation using this protocol.

### **Example:**

The control panel sends:

#1234 NdaMM-DD-YYtiHH:MM:SS/id22/CL/PA31

The receiver will send this signal to the automation as:

SRRLlL[#1234|Nda04-22-94ti16:02:15/id22/CL/PA31][DC4]

## 4.8 Telephone Number Protocol (4)

**4RRLLlLAAAAAALLLTTTTTTT[DC4]**

Where, 4 : Protocol number.  
RR : Virtual Receiver number.

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LLL : Virtual Line number.  
 AAAAAA : Account code. If Account code is less than 6 digits, leading spaces will be added.  
 LLL : Long distance area code. If no area code is received, sends '000'.  
       If only one digit area code is received, sends '001'.  
 TTTTTTT : Local phone number.  
 [DC4] : Terminator, 14 Hex.

## 4.9 Contact-ID (4 digit account) Protocol (5)

**5RRLLLs18AAAAQXYZGGCCC[DC4]**

Where, 5 : Protocol number.  
 RR : Virtual Receiver number.  
 LLL : Virtual Line number.  
 s : Space.  
 18 : Contact-ID format identifier. (98 can also be used)  
 AAAA : Four digit account codes.  
 Q : Qualifier, E= New event or opening,  
       R= New restore or closing.  
       P= Previous event  
 XYZ : Class code and event codes.  
 GG : Group number.  
 CCC : Zone codes or user ID.  
 [DC4] : Terminator, 14 Hex.

## 4.10 Contact-ID (10 digit account) Protocol (Q)

**QRRLLLs58AAAAAAAAAAQXYZGGCCC[DC4]**

Where, Q : Protocol number.  
 RR : Virtual Receiver number.  
 LLL : Virtual Line number.  
 s : Space.  
 58 : 10-digit account Contact-ID format identifier.  
 AAAAAAAAAA : Ten digit account codes.  
 Q : Qualifier, E= New event or opening,  
       R= New restore or closing.  
       P= Previous event  
 XYZ : Class code and event codes.  
 GG : Group number.  
 CCC : Zone codes or user ID.  
 [DC4] : Terminator, 14 Hex.

### **Example:**

Account 1234 sends in a duress alarm with group number 01, and zone code 001, the receiver of receiver number 01 and line number 100 will send the following signal:

501100s181234E12101001[DC4]

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## 4.11 MODEM II / MODEM IIE / MODEM IIIa<sup>2</sup>/ BFSK Protocol (6)

**6RRLLLaaaaaaAAAAXXYYYY[DC4]**

When used with the SUR-GARD interface, this protocol is compatible with the RADIONICS D6500 Mode, except that the protocol number is '6'.

Or 1RRLLLaaaaaaAAAAXXYYYY[DC4]

Where, 6 : Protocol number.  
RR : Virtual Receiver number.  
LLL : Virtual Line number.  
aaaaaa : Account code or space depending on the number of account digits.  
AAAA : Account code, if only 3 digits is received (BFSK) a leading space will precede.  
XX : Event code.  
YYYY : Two digit zone codes or first two digit user codes, if less than four, zeros or leading spaces will precede.  
[DC4] : Terminator, 14 Hex.

### **Example:**

4 digit account code: 601002ssssss1234sAsD01[DC4]  
6 digit account code: 601002ssss123456sAsD01[DC4]  
10 digit account code: 6010021234567890sAsD01[DC4]

When used with the RADIONICS 6500 interface, this protocol is fully compatible with the RADIONICS D6500 Mode. The SIA mode is only available on the DRL2000, DRL2E and DRL3 line cards.

## 4.12 MODEM II / MODEM IIE / MODEM IIIa<sup>2</sup> conversion to SIA Protocol (R)

**RRRLLL[#AAAAAA|Emmz/mmzzzMMZZZ][DC4]**

Where, R : Radionics Modem II SIA protocol identifier.  
rr : Virtual Receiver number.  
LLL : Virtual Line number.  
[ : Beginning Data Delimiter.  
# : Account ID Block Code.  
AAAAAA : Account ID. Can range from 4 – 10 digit accounts.  
| : Field Separator.  
E : Function Block Code.  
mm : Modifier  
zzz : Modifier zone  
MM : Event Code.  
ZZZ : Zone Code, User Code, Door or Relay.  
/ : Data Code Packet Separator.  
] : Ending Data Delimiter.  
[DC4] : Terminator 14 hex.

### **Example:**

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R98761[#1234|Nri7/id009ET002][DC4]

R98761[#1234|Nri7/pi010UA002][14]

Commonly used modifiers:

Signal	Modifier
Level	Lv
Value	va
Area	ri
ID	id
Path	pa
Phone	ph
Time	ti
SDI	pi
RG	rg
Sked	ai

**NOTES:** If the panel requests a translation, the receiver converts point data to zonex format and user IDs to Comex format. If there is no request for translation, points and IDs are transmitted to automation and printed with no conversion. User ID and point data are translated as shown below.

Point	Zonex
001-008	100-800
009-024	101-116
025-040	201-216
041-056	301-316
057-072	401-416
073-088	501-516
089-104	601-616
105-120	701-716
121-136	801-816
137-152	117-132
153-168	217-232
169-184	317-332
185-200	417-432
201-216	517-532
217-232	617-632
233-247	717-731
Id	Comex
0	0
1-5	001-005
06-13	601-608
14-21	701-708
22-29	801-808
30-37	B01-B08
38-45	C01-C08
46-53	D01-D08
54-61	E01-E08
62-69	F01-F08
70-249	000

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## 4.13 SESCOA Super Speed Protocol (7)

### 7RRLLsssssXXXXsIAACs[DC4]

Where, 7 : Protocol number  
 RR : Receiver number  
 LLL : Line number  
 sssss : Spaces  
 XXXX : Account code  
 s : Space  
 I : Event code from the SESCOA 3000 event code table  
 AA : Two digit zone codes or first two digit user codes  
 C : Space if zone report, or last digit user code  
 s : Space.  
 [DC4] : Terminator, 14 Hex.

The following gives the detailed information:

Event to be reported	Report	IAACs
A	Alarm 00-99	Axxss
D	Trouble 00-99	Txxss
E	Restore 00-99	Rxxss
F	Alarm/Restore 00-99	Dxxss
OP	Open, no user	Ossss
IOP	Open with ID	Oxxxxs
FOP	Fail to OP	Ussss
EOP	OP out of window	#ssss
LOP	OP out of window	#xxxxs
CL	Close, no ID	Cssss
ICL	Close with ID	Cxxxxs
FCL	Fail to CL	Qssss
ECL	CL out of window	\$ssss
LCL	CL out of window	\$xxxxs
DU	Duress	Yssss
24H	24 Hour Report	Hssss
CH	Test	Kssss
AC	AC fail	Jssss
EAC	AC Restore	Mssss
ELO	Power Restore	Essss
LO	Low battery	Fssss
FLO	No battery	Gssss
dB	Bell trouble	Zssss
EBL	Bell restore	!ssss
dPL	Phone trouble	Vssss
EPL	Phone restore	Xssss
AUD	Audio	Lssss

Where xx or xxx are the zone codes or user codes.

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## 4.14 Ademco High Speed & Scantronics Protocol (8)

(9 channel/zone output)

**8RRLLLAAsCCCCsCCCCsC[DC4]**

Where, 8 : Protocol number  
RR : Virtual Receiver number  
LLL : Virtual Line number  
AAAA : Account code  
s : Space  
CCCC : Channel 1-4  
s : Space  
CCCC : Channel 5-8  
s : Space  
C : Channel 9  
[DC4] : Terminator, 14 Hex.

(17 channel/zone output)

**8RRLLLAAsCCCCsCCCCsCCCCsCCCCsC[DC4]**

Where, 8 : Protocol number  
RR : Virtual Receiver number  
LLL : Virtual Line number  
AAAA : Account code  
s : Space  
CCC... : Channels 1-16  
s : Space  
C : Channel 17  
[DC4] : Terminator, 14 Hex.

The above examples are shown with 6 digit accounts, for accounts less than this, leading digits are not sent, for example 2-8-1 will be output as:  
8RRLLLAAsCCCCsCCCCsC[DC4]

### 4.14.1 Channel/Zone Status's (Digits 5 through 12 )

#### **Code 1 Example**

New event (previously unreported )

12341555555X

New event identified by auxiliary channel X on zone 1.

#### **Code 2 Example**

New opening (previously unreported)

1234552555552

New opening identified by auxiliary channel 2 from ID 3.

#### **Code 3 Example**

New restore (previously unreported)

123455535555 X

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New restore identified by auxiliary channel X on zone 4.

#### **Code 4 Example**

New closing (previously unreported )

12345545555554

New closing identified by auxiliary channel 4 from user ID 3.

#### **Code 5 Example**

Normal (no event since previously reported restore)

1234155555555X

New event identified by auxiliary channel X on zone 1, all other zones are OK.

#### **Code 6 Example**

Previous reported event still in effect

1234655555555X

Event previously identified by auxiliary channel X on zone 1 is still active.

#### **Code 0 Example**

New trouble

12345055555557

New Trouble on zone 2.

(0 can also be sent as A)

### **4.14.2 Auxiliary Channel/Zone (Last Digit)**

For the ninth channel (usually digit 13), the following channel status codes are used in addition to the Zone Status Code:

#### **Auxiliary Code 1 Example**

Duress report

Panel sends:

1234555555551

Description: Duress Report

#### **Auxiliary Code 2 Examples**

Opening report in the previous 8 channels (with user ID in channel 1)

Panel sends:

1234355555552

Description: Opening Report with user ID 3

Panel sends:

1234255555552

Description: Opening Report with user ID 2

Panel sends:

1234552555552

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Description: Opening Report with user ID 2

### **Auxiliary Code 3 Example**

Zone Bypass/Unbypass status report in the previous 8 channels

Panel sends:

1234551555553

Description: Zone 3 Bypass

Panel sends:

1234155555553

Description: Zone 1 Bypass

Panel sends:

1234355555553

Description: Zone 1 UnBypass

### **Auxiliary Code 4 Example**

Closing report in the previous 8 channels ( with user ID in channel 1)

Panel sends:

1234255555554

Description: Closing Report with user ID 2

### **Auxiliary Code 5 Example**

Zone trouble active / trouble restore status report in the previous 8 channels

Panel sends:

1234155555555

Description: Zone trouble active on zone 1

Panel sends:

1234555155555

Description: Zone trouble active on zone 4

Panel sends:

1234555355555

Description: Zone trouble restoral on zone 4

### **Auxiliary Code 6 Example**

System trouble active/restore reports in the previous 8 channels

Zone 1 AC lost

Zone 2 Low Battery

Zone 3 System Flow

Zone 4 Watch Dog Timer

Zone 5 System Message

Zone 6 Telco

Zone 7 not used

Zone 8 Sensor

Panel sends:

1234155555556

Description: AC lost

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Panel sends:  
1234555515556  
Description: System Message

Panel sends:  
1234355555556  
Description: AC Restoral

#### **Auxiliary Code 7 Example**

Zone alarm status report, alarms are reported in previous 8 channels.

Panel sends:  
1234155555557  
Description: alarm zone 1

Panel sends:  
1234555555517  
Description: alarm zone 8

Panel sends:  
1234155555537  
Description: alarm zone 1, restoral zone 8

#### **Auxiliary Code 8 Example**

New low battery (will not send restore)  
Panel sends:  
1234155555558  
Description: Alarm zone 1 and Low Battery

#### **Auxiliary Code 9 Example**

Test report, alarm status is reported in previous 8 channels.  
Panel sends:  
1234155555559  
Description: Alarm zone 1 and Test Report

#### **Auxiliary Code 0 Example**

Radio diagnostics, radio testing inf. reported in previous 8 channels.

Panel sends:  
1234555155550  
Description: Radio Diagnostic Zone 4

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## 4.15 Acron Super Fast Protocol (9)

**9RRLLssssAAAACCCCCCCC[DC4]**

Where, 9 : Protocol number  
 RR : Virtual Receiver number  
 LLL : Virtual Line number  
 ssss : Spaces  
 AAAA : Account code  
 CCCC : Channel 1-4  
 CCCC : Channel 5-8  
 [DC4] : Terminator, 14 Hex.

## 4.16 Silent Knight FSK1 (E)

**ERRLLLsssssAAAAXXssss[DC4]**

Where:

E : FSK1 protocol identifier.  
 RR : Virtual receiver number.  
 LLL : Virtual Line number.  
 s : spaces.  
 AAAA : the account number.  
 XX : alarm code.  
 s : spaces.

Possible alarm codes (XX) are as follows:

00	Alarm Panic		
01-08	Alarm 01-08	41-49	Closing 1-9
09	Hold-up	50-59	Bypass 10-19
10-19	Alarm 10-19	60	Trouble AC
20-29	Alarm Restore 10-19	61-68	Trouble 1-8
30	Test Code	69	Trouble Bat
31	Trouble Line 1	70	Restore AC
32	Trouble Line 2	71-78	Restore 1-8
33	Expand Trouble	79	Restore Bat
34	Forced Access	80	Access
35	Restore Line 1	81-89	Access 1-9
36	Restore Line 2	90	Opening
37	Expand Restore	91-99	Opening 1-9
38	Cancel Code		
39	Data Lost		
40	Closing		

## 4.17 Silent Knight SFSK2 protocol 1 (F)

The DRL2000 will provide two (2) possible outputs to the automation, according to an option value. When the option is programmed as “02” the automation output will be as follows:

**FRLLLLssssAAAAAYYZZss[DC4]**

Where:

F : represents the FSK2 protocol 1 identifier.  
RR : virtual receiver number.  
LLL : virtual line number.  
S : represents spaces.  
AAAAAA : the account number. If the account is 4 or 5 digits, the leading “A”s will be replaced by spaces.  
YY : represents the event code.  
ZZ : represents the zone/user number  
s : represents spaces.

Examples of Possible event codes (YY):

YT00 Battery Trouble  
YR00 Battery Restore  
DOZZ Access left open ID ZZ  
DFZZ Access Forced ID ZZ  
AT00 System Trouble - AC  
DSZZ Access Station ID ZZ  
AJ00 System Restore - AC  
LT0Z Trouble Phone Line#0Z  
ETZZ Expand Trouble Station ID ZZ (ZZ=17-31)  
ERZZ Expand Restore Station ID ZZ (ZZ=17-31)  
RP00 Automatic Test  
RXZZ Manual Test Zone ZZ  
CA Automatic Closing  
OA Automatic Opening  
CLZZ Normal Closing ID ZZ  
OPZZ Normal Opening ID ZZ  
CFZZ Forced Closing ID ZZ  
ORZZ Forced Opening ID ZZ  
OTZZ Supervised Opening ZZ  
CG0a Closing Area 0a  
OG0a Opening Area 0a  
DRZZ Access Granted ID ZZ

When the option is programmed as “01”, the automation output will be as follows:

## 4.18 Silent Knight FSK2 Protocol 2 (C)

**CRLLLLssssAAAAAXYZZss[DC4]**

Where:

C : represents the FSK2 protocol 2 identifier.  
RR : virtual receiver number.  
LLL : virtual line number  
S : represents spaces.  
AAAAAA : the account number. If the account is 4 or 5 digits, the leading “A”s will be replaced by spaces.  
X : represents the event code.  
Y : represents the condition code.

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ZZ : represents the zone/user number  
s : represents spaces.

Examples of possible event codes (YY) are as follows:

B600	Battery Trouble
F9zz	Access left open ID zz
BE00	Battery Restore
Fazz	Access Forced ID zz
C600	System Trouble - AC
FBzz	Access Station ID zz
CE00	System Restore - AC
FC00	Duress
D60z	Trouble Phone Line#0z
FE00	Data Lost
DE0z	Restore Phone Line 0z
E60z	Expand Trouble Device ID z
EE0z	Expand Restore Device ID z
E6zz	Expand Trouble Station ID zz (zz=17-31)
EEzz	Expand Restore Station ID zz (zz=17-31)
E100	Automatic Test
E2zz	Manual Test Zone zz
F000	Automatic Closing
F400	Automatic Opening
F1zz	Normal Closing ID zz
F5zz	Normal Opening ID zz
F2zz	Forced Closing ID zz
F6zz	Forced Opening ID zz
F3zz	Supervised Closing ID zz
F7zz	Supervised Opening zz
FD0a	Closing Area 0a
FF0a	Opening Area 0a
F8zz	Access

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## 4.19 CESA FSK 200 (G):

GRLLLLsssssAAAAAsXssZZ[DC4]

Where:

G represents the CESA protocol identifier  
RR represents the receiver number  
L represents the line number  
AAAAA represents the account number ( 5 digits)  
X represents the alarm type  
    0 = two-way Audio  
    1 = New event  
    2 = Restore  
    3 = Status: Alarm (after automatic test transmission)  
    4 = Status: Normal (after automatic test transmission)  
ZZ represents the zone number  
[DC4] represents the terminator  
s represents spaces

## 4.20 Robofon (H):

HRLLLLsssssAAAAAsEssYZ[DC4]

Where: H =Robofon protocol identifier.  
RR =Receiver number  
L =Line card number  
AAAAAA =Account code  
E =Event code  
YZ =Reporting code.  
[DC4] =Terminator

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## 4.21 ITI Protocol (I)

### IRRLLLsssACAAAAGIZZEWN[DC4]

Where, I : ITI protocol.  
RR : Virtual Receiver number.  
LLL : Virtual Line number.  
sss : Space characters.  
A : Highest character of the ITI Account Number.  
C : CPU panel type/zone Attribute Code.  
AAAA : Lower 4 characters of the ITI Account Number.  
G : Group Number.  
I : User ID for openings and closings.  
ZZ : Zone Number.  
E : Alarm condition code.  
W : Previous protection level.  
N : Current protection level.  
[DC4] : Terminator 14 hex.

The Sur-Gard SG-MLR2-DG ITI protocol is based on the ITI Generic format, with the protection levels added on.

The upper nibble of the byte C holds a code designating the panel type:

#### UPPER NIBBLE DESCRIPTION

2	Unknown CPU Panel
3	Non-ITI Panel
4	SX-III or SX-IVA
5	SX-IVB
6	SX-V
7	All other ITI Panels

The lower nibble of the byte C holds a code describing the zone's attributes. If the upper nibble is not a '7', the lower nibble is set to '0'. If the upper nibble is a '7', the lower nibble will represent:

LOWER NIBBLE	DESCRIPTION
0	Anything not listed below
1	CARETAKER PLUS
2	RF-COMMANDER

The Group Number and the User Number are calculated as follows:

#### REPORTED NUMBER GROUP/USER BYTE

0-9	'0'-'9'
10-35	'A'-'Z'
36-61	'a'-'z'
62 and greater	'?'

The Alarm Condition Code indicates the condition of the zone reporting to the receiver:

#### CODE DESCRIPTION

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A      zz Alarm  
 R      zz Cancel  
 G      zz One ring method.  
 D      zz Dial out method.  
 E      zz Exit Fault  
 S      zz Supervisory  
 L      zz Low Battery  
 B      zz Bypassed  
 T      zz Tamper Alarm  
 W      zz Restoral  
 J      zz Trouble  
 V      zz Instant method.  
 N      zz New log  
 I      zz Improper ID code  
 G      zz One ring meth.  
 D      zz Dial out meth.  
 A      77 Alarm! Tamper  
 A      78 Trouble  
 A      80 Alarm!  
 A      81 Alarm!  
 A      82 Alarm!  
 A      83 Phone Test  
 A      84 Opening User  
 A      85 Closing User  
 A      86 Alarm! Silent Duress  
 A      87 Force Armed  
 A      88 Trouble  
 A      90 AC Failure  
 A      91 Low CPU Battery  
 A      92 Alarm! Tamper Loop  
 A      93 Automatic Phone Test  
 A      94 CPU Receiver Fail  
 A      95 CPU Back In Service  
 A      96 Fail To Communicate

Where 'zz' represents the zone number.

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## 4.22 FBI Protocol (J)

JRRLLLssssssAAAATZZEss[DC4]

Where:

J = FBI protocol identifier  
RR = Virtual receiver number  
LLL = Virtual Line number  
s = spaces  
AAAA = Account code.  
T = Zone type  
ZZ = Zone number, in hex.  
E = Event code, if E=0 and T=0 : listen in.

## 4.23 Outel (L):

LRRLLLssssssss00AAEss0Z[DC4]

Where L =The Outel Format Identifier.  
RR =The receiver number.  
L =The receiving Line Card number.  
s =Spaces.  
0 =Leading zero's to act as filler digits.  
AA =The two digit account code.  
E =The corresponding Event code of the received reporting code.  
Z =The received reporting code.  
[DC4] =The terminator string from the receiver.

## 4.24 Stratel (N)

NRRLssAAAAAAAAAs1ss23[DC4]

N Protocol Identifier (N for Stratel)  
RR Receiver Number  
L Line Number (Hex value from 1 to E)  
AA..AA 8 digit Account Code  
1 Message Identifier (see table on next page)  
23 Message (see table on next page)  
s Space  
[DC4] Terminator (14 hex)

Computer Output Con't...MLR 2...

Message Identifier (1):

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A Alarm  
T Trouble  
R Restore

### ***Message (23):***

#### **For Group A:**

x A1 In or Out of Service  
x=R or T If IN SERVICE, R A1 is displayed  
If OUT OF SERVICE, T A0 is displayed

T A2 Low Battery  
If the Panel battery voltage is LOW (below 10.5Vdc) 2 is displayed

T A3 Cyclic Test  
When the cyclic test occurs, 3 is displayed

A4 Reserved, nothing displayed  
A5 Reserved, nothing displayed  
A6 Reserved, nothing displayed  
A7 Reserved, nothing displayed  
A8 Zone Expansion Modules  
If there are zone expansion modules present

#### **For Group B:**

A B1 Zone 1  
If tripped, 1 is displayed

A B2 Zone 2  
If tripped, 2 is displayed

A B3 Zone 3  
If tripped, 3 is displayed

A B4 Zone 4  
If tripped, 4 is displayed

A B5 Zone 5  
If tripped, 5 is displayed

### ***Computer Output...Con't...MLR 2...Message...Group B...***

A B6 Zone 6  
If tripped, 6 is displayed

A B7 Zone 7  
If tripped, 7 is displayed

A B8 Zone 8  
If tripped, 8 is displayed

**Note:** Groups C to I follow the same format as group B, except the letter is replaced accordingly.

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***Examples:***

**Out of Service:** N012 12345678 T A0[14][6]  
**In Service:** N012 12345678 R A1[14][6]  
**Low Battery:** N012 12345678 T A2[14][6]  
**Cyclic Test:** N012 12345678 A A3[14][6]  
**Zone 1:** N012 12345678 A B1[14][6]  
**Zone 2:** N012 12345678 A B2[14][6]  
**Zone 3:** N012 12345678 A B3[14][6]  
**Zone 4:** N012 12345678 A B4[14][6]  
**Zone 5:** N012 12345678 A B5[14][6]  
**Zone 6:** N012 12345678 A B6[14][6]  
**Zone 7:** N012 12345678 A B7[14][6]  
**Zone 8:** N012 12345678 A B8[14][6]

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## 4.25 DMP Protocol (P)

PRRLLsAAAAAsXT<sub>1</sub>...T<sub>n</sub>s[DC4]

Where:

P = DMP protocol identifier  
RR = Virtual receiver number  
LLL = Virtual Line number  
s = spaces  
AAAAA= Account code.  
X = DMP serial format identifier  
T<sub>1</sub>-T<sub>n</sub> = Alarm Information

P01100 243 X002004N HALL MOT

Examples:

P01001s12345sA00081EASTsSMOKEs[DC4]

P01001s12345szA00085555116NORTH OFFICE PRI15S. WEST BUILDINGs[DC4]

The above two automation signals are both DMP Serial1 format. The 14<sup>th</sup> character in the above examples will determine if the received format is Serial1 or Serial3. Following the account and a space, if this character is anything but an uppercase 'Z', the DMP format is Serial1. If you look at the below signal, you will see that the 14<sup>th</sup> digit is an uppercase 'Z', therefore the signal is Serial3 format.

P01001s12345sZa\61\t "BU\z 0232"FRONT DOOR\a 03"OFFICE\u 0568"JOHN SMITH\[DC4]

NOTE: The position of the DMP Serial Format Identifier can change, depending of the line card number length.

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## 4.25.1 SG/DMP Automation Output Additional Information

The SG output is very similar to the output of the DMP receiver. The SG output supports both the serial1 and serial3 format.

Below is a comparison of the Receivers.

Options	DMP default	SG default
Host Test interval:	1 min	CPM configuration see manual
Acknowledge Timeout:	5 sec	CPM configuration see manual
Line Number Length:	0	5 (RRLLL see option[2])
Zone Number Length:	2	2 (see option[17])
User Number Length:	2	2 (see option[17])
Host Baud:	9600	CPM configuration see manual.
Start Character:	NONE	P
Abort by user:	No	No
Area Format:	Binary	Binary (see option[B1])
Retries to Host:	5	CPM configuration see manual
Serial 3 Messages:	No	Yes
Print Always:	Yes	Yes
CRC:	No	No
Sequence Number:	No	No
Use "z" Zone messages:	No	No
Update Time to Panels:	No	No
Hours from GMT:	6	N.A.
Termination Character:	0x0d	0x14

Serial 1 example (s = space)

DMP: s33333sA041LOOP4sssss[0d]

MLR: P01001ss33333sA041LOOP4sssss[14]

Serial 3 example (s = space)

DMP: s12345 Zg\45\h 20\d 12-25\u 00001"WILLIAM SMITH[0d]

MLR: Ps12345 Zg\45\h 20\d 12-25\u 00001"WILLIAM SMITH[14]

## 4.26 Telenot/Telim (T)

**TRRLLLssssAAAAAAsEssZZ [DC4]**

Where	T	= the Telenot format identifier.
	RR	= the receiver number.
	L	= the line card number.
	AAAAAA	= the account code.
	s	= Spaces.
	E	= the ASCII code being sent by the panel.
	A	represents Alarm
	F	represents Fault
	H	represents Maintenance Restoral
	K	represents Restore
	L	represents Maintenance Alarm
	N	represents Emergency Alarms

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O	represents Call
Q	represents remote programming
R	represents Test Transmission
T	represents Closing
U	represents Opening

ZZ	= the zone or user number.
[DC4]	= the terminator character.

## 4.27 VONK (V)

### Static Format:

VRRLAA123456789ABCDEFG[DC4]

where

V	= Protocol number
RR	= Receiver number
L	= Line card number
AA	= Account code
1-G	= Zone 01-16
[DC4]	= Hex 14 as terminator

### Dynamic Format

1RRLsssss00AAEssZZ[DC4]

## 4.28 SURTEC PROTOCOL (Y)

YRRLLLsAAAAAAAAAsT<sub>1</sub>...T<sub>n</sub>[DC4]

Y	=	Surtec protocol identifier
RR	=	Virtual receiver number
LLL	=	Virtual Line number
s	=	spaces
AAAAAAAA	=	Account code.
T <sub>1</sub> -T <sub>n</sub>	=	Alarm Information

Each event is represented by 2 digits. Each digit in the range of 0-9. Event codes range from 01-99. Restore is represented by the event code followed by 09. The maximum number of events in one transmission will be limited to 8 events per message. From example below, 8 2 0 9 will be considered as one event. Thus, maximum of 32 bytes of buffer space will be allocated for the event frame section of the received data.

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## 4.28.1 Surtec examples

1. Loop opening : 8 2

**YRRLLLsAAAAAAAs82[DC4]**

2. Closing of same loop : 8 2 0 9

**YRRLLLsAAAAAAAs8209[DC4]**

3. Quick Open/Close of same loop : 8 2 8 2 0 9

**YRRLLLsAAAAAAAs828209[DC4]**

4. Opening multiple loops : 8 2 1 5 4 5

**YRRLLLsAAAAAAAs821545[DC4]**

5. Restore of same : 8 2 0 9 1 5 0 9 4 5 0 9

**YRRLLLsAAAAAAAs820915094509[DC4]**

## 4.29 CALLING NAME PROTOCOL (u)

**uRRLLLAAAAAnnnnnnnnnnnnnnnnnnn[DC4]**

Where: u Calling Name protocol identifier  
RR virtual receiver number  
LLL virtual line number  
AAAAAA is the account number (leading spaces or leading zeros if account is less than 6 digits)  
nnn... is the calling name (up to 18 ASCII characters, may include spaces or dashes, trailing spaces will be inserted if calling name or number is less than 18 characters.  
[DC4] terminator, 14 Hex

## 4.30 INTERNATIONAL CALLER ID PROTOCOL (U)

**URLAAAAATTTTTTTTTTTTTTTTTTTT[DC4]**

Where: U is International caller ID protocol identifier  
RR is the receiver number  
L is the line number  
AAAAAA is the account number (leading spaces or leading zeros if account is less than 6 digits)  
TTT... is the telephone number (up to 18 digits, may include spaces or dashes, trailing "F" will be inserted if the telephone number is less than 18 digits.  
[DC4] terminator, 14 Hex

## 4.31 VONK (V)

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## Static Format:

**VRRLAA123456789ABCDEFG[DC4]**

where

V = Protocol number  
RR = Receiver number  
L = Line card number  
AA = Account code  
1-G = Zone 01-16  
[DC4] = Hex 14 as terminator

## Dynamic Format

**1RRLsssss00AAsEssZZ[DC4]**

## 4.32 SG Westec Formats Automation Output (W)

### 4.32.1 Westec Data line type (01: Housekeeping messages) (Modular Format):

**WRRLLLGGGMMEIITTTTSSPPCCUAAAADDDRPPPPPPPPPPX1FUKK[ DC4 ]**

Where, W : Westec Protocol number.

#### **Header**

RR : Receiver number. (DNIS)  
LLL : Line number. (DNIS)  
GGG : Cage ID is receiver id. First Two bytes are shelf ID in Hex, last byte is Slot ID in Hex  
MM : Programming Checksum, Always spaces.  
E : Telephone line number. Always space.

#### **Body**

II : Data line type 01. This is the type of data line.  
TTTT : Transaction number, spaces.  
SS : Dialer Type. (received from start line)  
PP : Programmed line account suffix. (Stored in DNIS).  
CC : Call attempts ( may be decimal ) made by the dialer,  
U : Undefined. Always spaces.  
AAAA : Account Code, 4 digits  
DDDR : Location Code and Rotary Code. Received from the dialer or Stored DDD if the dialer does not send it.  
PPPPPPPPPP : Temporary phone number.  
X : Phone line ID sent by dialer ( systems with 2 phone lines )  
I : Talk in digit. 0 = no talk in, 1 =talk in  
F : Foreign Account flag. 0 = home account, 1 = foreign account (Location in DNIS must Match to Location ID to product Home = 0)  
U :Unidentified - Space  
KK : Checksum calculated on all preceding digits from receiver.  
[DC4] : Terminator, 14 Hex.

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E.g.: (s = Space)

W0100101FSSSS01SSSSFFPPs1s123471444166654494100sKK[DC4]

#### 4.32.1.1 System Dialer type: SS

The start digit of the round will determine the format type of the dialer.

Format Type	System Dialer type	Version
W5000/Modular format	4	C6S
W5000/Modular format	5	C6K
W5000/Modular format	6	W6S
W5000/Modular format	7	W6K
W5000/Modular format	8	C4S
W5000/Modular format	9	C4K
W5000/Modular format	A	W4S
W5000/Modular format	B	W4K
W5000/Modular format	C	W1S
W5000/Modular format	D	C5K
W5000/Modular format	E	W5S
W5000/Modular format	F	W5K

#### 4.32.2 Westec Signal Protocol Data line type (02: Event messages)

WRRLLLGGGMMEDDXEESDMM...00KK[DC4]

Where, W : Westec Protocol number.

##### Header

RR : Receiver number. (DNIS)

LLL : Line number. (DNIS)

GGG : Cage ID is receiver id. First Two bytes are shelf ID in Hex, last byte is Slot ID in Hex

MM : Programming Checksum, Always spaces.

E : Telephone line number. Always space.

##### Body

DD : Data line type. (02)

X : Data line number. This number will increment as each data line is received.<sup>0</sup>

EE : Event code descriptor

S : Event status

D : Descriptor. Each bit of the descriptor will determine the what the following bytes will be.

MM(variable) : Data message. The number of bytes can be variable depending on the descriptor. See following table .

... : More event messages can be sent by a repeat of "EESDMM".

00 : End record marker

KK : Checksum calculated by receiver for previous digits

[DC4] : Terminator, 14 Hex.

**Event codes:** There are 256 (00 – FF ) possible event codes. Not all of them have been defined.

EVENT CODE :EE
00: NUL ( END OF LOGICAL LINE )
01: ALL CLEAR

<sup>0</sup> A data line number of 0 is the kiss-off line.

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02: FIRE
03: EMERGENCY
04: BURGLARY
05: AUX BURGLARY
06: DURESS
07: MEDICAL
08: SPECIAL 1
09: SPECIAL 2
0A: SPECIAL 3
0B: SPECIAL 4
0C: SPECIAL 5
0D: SPECIAL 6
0E: SPECIAL 7
0F: SPECIAL 8
10: TAMPER
11: TEST
12: AGENT ARRIVAL
13: AGENT EMG
14: HOLD UP
15: *****
16: *****
17: *****
18: POWER UP
19: PROGRAMMED
1A: UNDEFINED
1B: *****
1C: CPU TRB
1D: SYSTEM TRB
1E: *****
1F: *****
20: INPUT
21: *****
22: *****
23: *****
24: SW TRB 0 day)
25: TROUBLE
26: DISPLAY
27: KEYBOARD
28: PHONE
29: BELL
2A: *****
2B: *****
2C: *****
2D: AC
2E: LOWBAT
2F: AUTO TEST
30: *****

#### Event status: S

##### Event Status: Definition

0: CLEAR TROUBLE
1: ARMED (CLOSE) – transition to armed/ may include user #
2: ARMED BYPASS – transition to armed w/perimeter zones out ( may be Force Arm, or Manual shunt while armed, may include user # )
3: ACTIVE – armed and tripped
4: CONFIRMED – active and not aborted for programmed time period

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5: REPORTED ACTIVE – still active, but previously reported / may include user #
6: RE-SET – manually put out of alarm to armed state/ may include #
7: AUTO – RESET – timeout of ringing alarm to armed /may include user id
8: DISARM (OPEN) / may include user id
9: TROUBLE

#### Descriptor Digit: D

Bit	Definition
Bit 0	Area number present
Bit 1	User I.D. present
Bit 2	Zone information
Bit 3	Text present (m.s. bit)

#### Data message: MM(variable number of bytes )

The message type is dependent on what bit is set on the descriptor digit

Message	Digits
Area number present	XX ( 00 – FF )
User I.D. present	XX ( 00 – FF )
Zone map length	XX ( 00 – FF )even
Zone map	Xn ( 00 – FF ) Variable
Text length	XX ( 00 – FF )
Text present	Xn variable

If more events messages are required on the round the “EESDMM...” bytes can repeat to signify the other event messages. The end of record marker (OO) will end the round.

#### Zone Map

The digit and number of digits received determine the zones used. The digits received is converted to binary digits and each set digit represent the zone. The LSB is the lower zone. **Note:** In the raw data, the zone information is “byte swapped” meaning that 5-8 is received first, 1-4 is received second and so on.

For example: Burglary alarm on zones 1 - 10 → 02044404FF300000XX

02: alarm round  
04: burglary  
4: confirmed: active but not aborted  
4: (0100) zone mapping required  
04: four nibbles to follow (only even values are allowed)<sup>i</sup>  
F: Zone 4, 3, 2, 1  
F: Zone 8, 7, 6, 5  
3: Zone 12, 11, 10, 9  
0: Zone 16, 15, 14, 13  
00: two zero digits always precede checksum  
XX: checksum

Note: Multiple alarms can be sent with all their corresponding bits set. Multiple events can be sent in another round with the identifier 02.

Eg. Reporting Zone 90 Emergency Reset User 0

<sup>i</sup> Note zone numbers are sent in “lowest order” first

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Note: Anything other than 0 in the condition flag indicates an incomplete call or any other type of improper ending. A talk in will occur before this line is sent.

Eg.

W2345601Csss000KK[DC4]

## 4.32.5 Westec Signal Protocol Data line type (44: audio wavefile handle) (FUTURE):

WRRLLLGGGMMEEI sssssssssssAAAADDDR X[ HHH... ]KK[ DC4 ]

Where, W : Westec Protocol number.

### Header

RR : Receiver number. (DNIS)

LLL : Line number. (DNIS)

GGG : Cage ID is receiver id. First Two bytes are shelf ID in Hex, last byte is Slot ID in Hex

MM : Programming Checksum, Always spaces.

E : Telephone line number. Always space.

### Body

II : Data line type (44)

s : Spaces

AAAA : Account Code, 4 digits.

DDDR : Location Code and Rotary Code. As received from the dialer or spaces if the dialer does not send it.

X : Data line number. This number will increment as each data line is received.

[HHH...] : NFS must mount full pathname for wave file. Up to 63 characters.

[DC4] : Terminator, 14 Hex.

KK : Checksum calculated on all preceding digits

Example of Network File System (NFS) pathname is hosts: /usr/sg/audio/wave/xxxxxxxxx.wav.

Eg.

W2345601Csss44 sssssssssss123471403 [ mlr2000:/usr/sg/audio/wave/xxxxxxxxx.wav ]KK[ DC4 ]

## 4.32.6 Westec Signal Protocol Data line type ( 40: Old Dialer type):

Data line type 40 has a different structure and decoding method than the older data line types.

WRRLLLGGGMMEDDTTTTSSPPCCXAAAADDDRNNNNNNNNNNNEEEEEEEB BBBQ QHHZZZZZZTTTTTTTK  
K[DC4]

Where, W : Westec Protocol number.

### Header

RR : Receiver number. (DNIS)

LLL : Line number. (DNIS)

GGG : Cage ID is receiver id. First Two bytes are shelf ID in Hex, last byte is Slot ID in Hex

MM : Programming Checksum, Always spaces.

E : Telephone line number. Always space.

### Body

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DD : Data line type (40)  
 TTTT : Transaction number, spaces.  
 SS : System dialer type  
 PP : Programmed line suffix. From DNIS Table  
 CC : Call attempts( decimal )  
 X : Data row number. This number will increment as each data row is received (0 is end of Message).  
 AAAA : Account Code, 4 digits  
 DDDR : Location id and rotary ID transmitted of if not from DDD comes from DNIS table  
 NNNNNNNNNN: Temporary phone number.  
 EEEEEEEE : Alarm Bits  
 BBBB : Status Bits  
 QQ : User id  
 HH : Action id codes  
 ZZZZZZ : Zone alarm status ( 24 bits ) Each zone is represented by a bit.  
 TTTTTT : Zone trouble status ( 24 bits ). Each zone is represented by a bit.  
 KK : Checksum calculated on all preceding digits  
 [DC4] : Terminator, 14 Hex.

Ex.

**W0100101Csss40ssssSSss011567871404166650283EEEEEEEEBBBBBQQHHZZZZZZTTTTTTKK[DC4]**

#### 4.32.6.1 System Dialer type: SS

The start digit of the round will determine the format type of the dialer.

Format Type	System Dialer type	Version
700 Not Supported	1	700 Not Supported
None	7	C2K
W900	C	970
W1000/W2000/W3000	2	W1C
W1000/W2000/W3000	3	W3C
W1000/W2000/W3000	7	W2C
W1000/W2000/W3000	A	W1K
W1000/W2000/W3000	B	W3K
W1000/W2000/W3000	F	W2K+
W800	E	None
Old 2000	9	TEMP 2K
Old 2000	D	W2K

#### Data Row number: X

DATA ROW NUMBER = 0

Every contact will end it's communication with a data row number = 0. Depending upon the dialer type, this can indicate a trouble condition.

If the system type is 01 - 0F (hex), the following codes apply.

If the data row number is 0, the Alarm bits are redefined as follows:

X		Trouble indicator
0	=	NORMAL ENDING
1-F	=	ABNORMAL ENDING

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If any bit 1-4 is set, then the next 14 characters are the raw data sent by the dialer which for some reason cannot be decoded. It may be possible for a person to decode them by sight.

XXXXXXXXXXXXXXXX = Raw dialer data

#### 4.32.6.2 Alarm events: EEEEEEE

Bit	Alarm condition
1	ALL CLEAR
2	Fire 1
3	Fire 2
4	Fire 3
5	CPU trouble
6	Burglary
7	Aux. Burg
8	Burglary Trouble
9	Emergency
10	AC Restore
11	Medical
12	*NOT USED*
13	Duress
14	Power up
15	Test
16	Special 1
17	Special 2
18	Special 3
19	Armed
20	Unarmed
21	Force armed
22	Agent emergency
23	Agent reset
24	Agent Arrival
25	Auto test
26	Low battery
27	AC off
28	Tamper 1
29	Tamper 2
30	Trouble system
31	Trouble switch
32	Aux. Alarm

The all clear bit will be set when:

format1: all the (new AND old) alarm AND zone bits are 0  
format2: all the (new AND old) alarm AND trouble AND zone bits are 0  
format3: all the bits are 1 (after performing the encryption)  
format5: all the (new AND old) alarm AND trouble AND zone bits are 0

#### Status Condition: BBBB

Bit	Status condition	
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1	Interior A
2	Interior B
3	Set
4	Night
5	A/C off
6	Force set
7	Selects code
8	Aux. burg set
9	Foreign Account( important )
10 - 16	Not defined

#### User ID: QQ

User ID: QQ	User condition
01 – 10 (hex)	User id 1 – 16
F1	Input 1
F2	Input 2
F3	Input 3
F4	Input 4
FE	Quick code
FF	System

#### Action ID codes: HH

HH	Action Id codes
00	Normal
01	System A on
02	System A off
03	System B on
04	System B off
05	Interior A on
06	Interior A off
07	Interior B on
08	Interior B off
09	System A force
0A	System B force
0B	Door strike
0C	Special on
0D	Special off
0E	Programming on
0F	Duress
10	Programming off

### 01: Housekeeping line

WRLLLLGGGMMEIITTTTSSPPCCUAAAADDDRPPPPPPPPPPXIFUKK[DC4]

Ex. W0100101Fsss01ssssFFPPs1s123471444166654494100sKK[DC4]

### 02:Event messages

WRLLLLGGGMMEDDXEESDMM...00KK[DC4]

Eg. Reporting Zone 90 Emergency Reset User 0

W3456701Csss0220334180000000000000000000002003620000KK[DC4]

### 03:status messages

WRLLLLGGGMMEDDXHHHHSSM...SSM...KK[DC4]

Ex. W2345601Csss031ssssSSM...SSM...KK[DC4]

### 00:End of transaction message

WRLLLLGGGMMEDDCKK[DC4]

Eg. W2345601Csss000KK[DC4]

### 40:Old dialer type

WRLLLLGGGMMEDDTTTTSSPPCCXAAAADDDRNNNNNNNNNNNEEEEEEEEEBBB  
BQQHHZZZZZZTTTTTTKK[DC4]

Ex. W0100101Csss40ssssSSss011567871404166650283EEEEEEEEBBBBBQHHZZZZZZTTTTTTKK[DC4]

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## 4.33 SIM Number Protocol (s)

sDDDDDAAAAAAAAASSSSSSSSSSSSSSSSSSSSSS[DC4]

Where, s : Protocol number.  
DDDDD : DNIS digits. 5 digits.  
AAAAAAAAA: Account code. If Account code is less than 10 digits, leading spaces will be added.  
SSS... : SIM number. 21 digits. If less than 21 digits, leading zero's will be added.  
[DC4] : Terminator, 14 Hex.

## 4.34 Command ACK/NAK Packets (0x06, 0x15)

SG-CPM3 v1.70 and higher and SG-System II support [Automation Command packets](#), in response the receiver will reply with an ACK or NACK.

Signal	Value	Condition
ACK	06H	Receiver processed the command successfully
NAK	15H	Receiver could not process the command successfully

The receiver will then wait a minimum of 500ms before sending the next Alarm or Heartbeat packet.

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## 5.0 RRLl to DNIS

On the MLR2000 and System III receivers, the RRLl field can be configured per line as either Virtual Receiver Line Numbers or Routed DNIS:

### 5.1 Virtual Receiver Line Numbers

RRL, RRLl, RRLll, or RRLlll (with Lll in decimal)

### 5.2 Routed DNIS

On the MLR2000, RRLll field can be overwritten by the DNIS as provided by incoming line as an option on the line cards. The DNIS is routed directly from the digits supplied by the incoming line, only the right 5 digits are routed if more than 5 digits DNIS are received, a maximum of 10 digits can be routed.

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## 6.0 Detailed Description of Com Outputs

### 6.1 SG outputs (TCP/IP and RS232)

#### 6.1.1 RS-232 Configuration

The serial ports are RS-232 communications ports that are used to send alarm events to a computer running automation software. The user can configure the port settings

Baud Rate: 1200, 2400, 4800, 9600, 19200 and 38400.

Data Bits: 7, 8 or 9

Parity: No Parity, Odd Parity or Even Parity.

Stop Bits: 2

**NOTE: If 7 data bits are configured, the data will be limited to ASCII.**

### 6.2 TCP/IP Sockets and Ports

TCP/IP ports are available only on the System II, System III and MLR2000 receivers. Each CPM has a user selectable IP address (which is applied on the next reboot) and Port base address. By default the CPM2000 will use IP address 10.0.7.100 on the primary and 10.0.7.101 on the secondary. The default the CPM3 is also 10.0.7.100.

Base Port #	Port Name
1025	SG-Automation Port
1026	UCS-Automation Port (MLR2000 only)

## 6.3 TCP/IP Connection Description

The Automation “Client” attaches a socket to the CPM “server” as per the following diagram after Stevens “Unix Network Programming” Prentice Hall 1990 section 6.2.

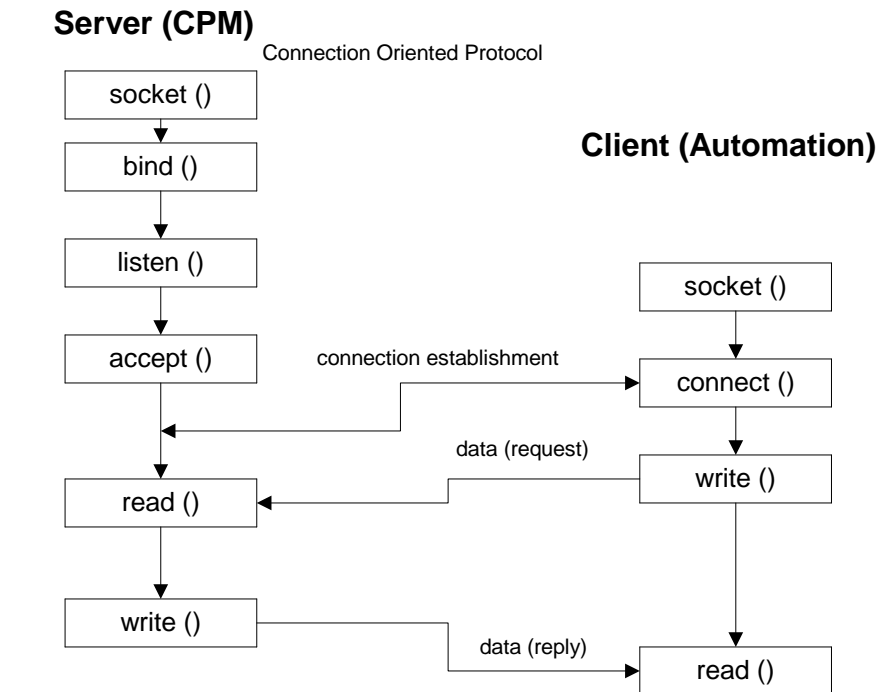


Figure 1 Socket system calls for connection-oriented protocol

## 6.4 Automation Responses

When the CPM sends an alarm to the automation, it checks for 3 types of responses:

Signal	Value	Condition
ACK	06H	automation got the event successfully
NAK	15H	automation got the message but data was invalid
No response		Automation absent, not connected

If a value is sent by the automation that is not known by the receiver (for example a corrupted ACK), it will be ignored by the receiver and the previous alarm will be resent.

An ACK tells the CPM the automation got the event successfully. A NAK tells the CPM the automation got the message but didn't understand it. The CPM will attempt to send the message 20 times. If after 20 attempts it continually got NAK from the automation, the CPM will send a communication error message to the printer, and then begin attempting to send the next event in the buffer to the automation. Any other response from the automation, including no response will cause the CPM to attempt to send the message again, up to 4 attempts. If after 4 attempts the CPM got no response or an unknown response, it will generate an output failure.

### 6.4.1 Automation Command Packets

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SG-CPM3 v1.70 and higher supports the ability to update the time and date from the automation via the TCP/IP socket only. The Automation Command Packets may be sent only in response to any packet sent by the receiver. The command is sent in the following structure to the CPM3.

Signal	Command	Length	Date	Time	Description
ACK + COMMAND	17	00 0B	07 D5 05 05	00 0E 1F 00	ACK the previous alarm and set the time & date to May 5, 2005 2:31:00pm

(note the above values are hex bytes)

The **Set Date/Time** command sets the current date and time on the CPM3 to the date and time setting. This in turn also has the effect of updating the date and time on all of the line cards. The Date and Time fields are each 4 byte integer values, which are described below. An ACK is returned if the requested data and time were successfully set; NAK is returned if an error occurred (i.e. the values sent were an invalid data or time representation) See also the Receiver [Command ACK/NAK packets](#).

	Field	Bits
Date	Year (A.D.)	31-16
	Month (1-12)	15-8
	Day (1-31)	7-0
Time	Hour (0-23)	31-16
	Minute (0-59)	15-8
	Second (0-59)	7-0

## 6.4.2 Automation Absent Condition

When the automation is not responding to the output transmissions, the CPM will generate a trouble. When an output trouble occurs, the CPM will continue to attempt to send a signal to the automation until it gets a response. The signal that is used and the timing of the signal are dependent on whether the heartbeat signal is enabled or not.

The CPM will use the heartbeat signal to poll the output for a response. It will make 4 attempts, then wait a programmable heartbeat interval of time before making another 4 attempts. The typical heartbeat interval is 10 seconds.

Supervisory Heartbeat Signal Protocol (1):

1RR000ssssssssss@ssss[DC4]

RR : Receiver number (Real programmed number, never virtual).  
S : Space Character.  
@ : Supervisory Signal.  
[DC4] : Terminator, 14 Hex.

This signal is used to supervise the communication between the receiver and the automation. Once one acknowledgement of this signal, with an [ACK] is sent by the automation, the link shall be considered restored.

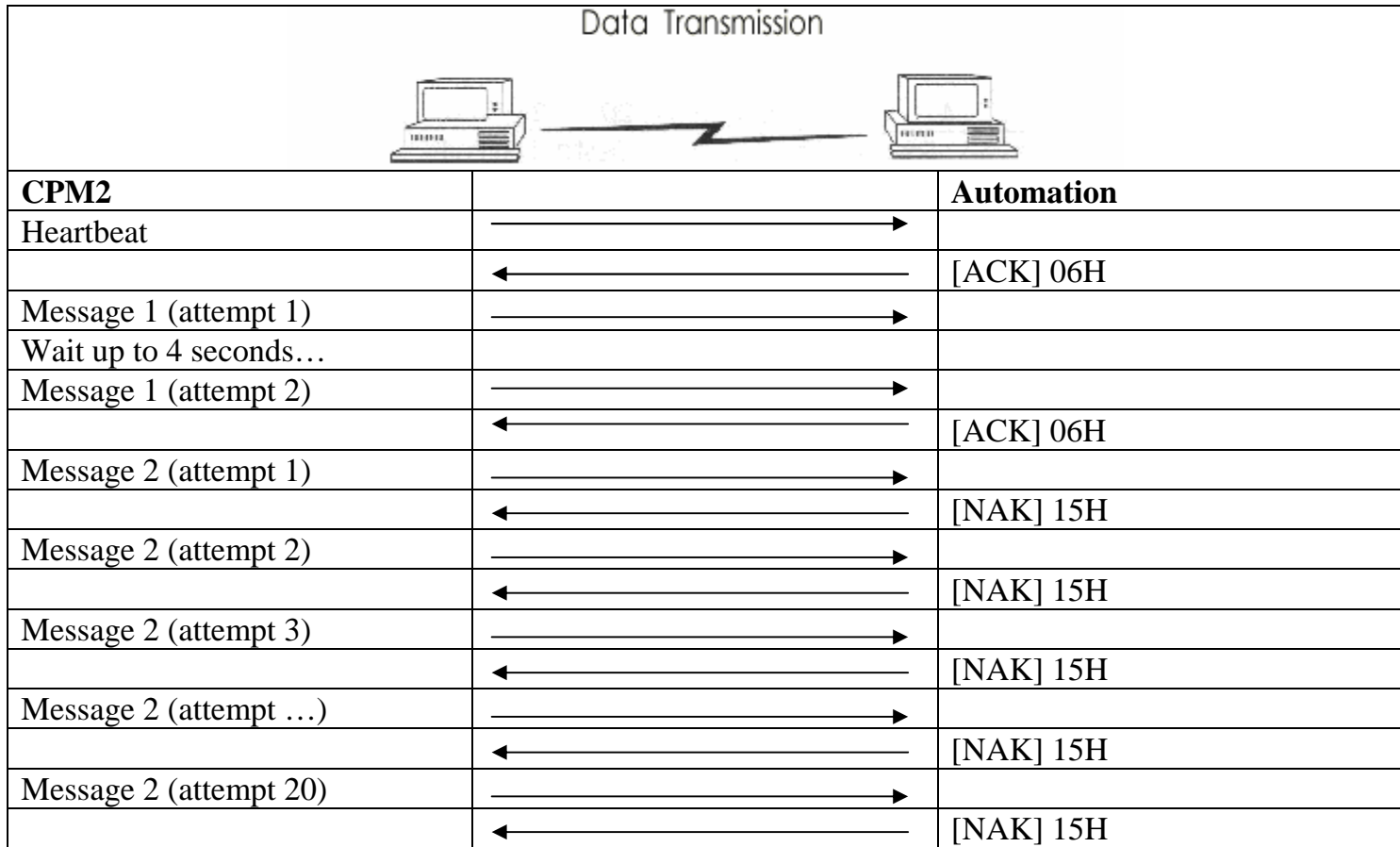
If a computer/automation failure should occur, the CPM will switch to manual mode, meaning manual acknowledgements for each signal. When the receiver buffer(s) become full, the line cards will stop answering the calls.

## 6.5 Signals Data Flow And Timings

The Sur-Gard receiver requires an acknowledgement signal [ACK] (Hex 06) from the automation software within 4 seconds for each message sent. Failure to receive the [ACK] will result in the re-transmission of the same signal three times before giving up. If the receiver receives a [NAK] (hex 15), the Receiver will re-send the signal 20 times before giving up and process the

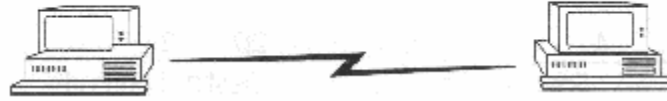
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next queued signal. In case of communication failure with the automation, the Sur-Gard receiver can store up to 255 messages per line card in its internal memory. The communication is resumed when the first ACK is received on the heartbeat.





## Data Transmission



CPM2000/CPM3		Automation
Heartbeat	→	
	←	[ACK] 06H
LC1-Message 1 (attempt 1)	→	
Wait up to 4 seconds...		
	←	[ACK] 06H
LC2-Message 1 (attempt 1)	→	
	←	[ACK] 06H
LCX-Message 1 (attempt 1)	→	
	←	[ACK] 06H
LC1-Message 2 (attempt 1)	→	
	←	[NAK] 15H
LC2-Message 2 (attempt 1)	→	
	←	[ACK] 06H
LCX-Message 2 (attempt 1)	→	
	←	[ACK] 06H
LC1-Message 2 (attempt 2)	→	
	←	[NAK] 15H
LC2-Message 3 (attempt 1)	→	
	←	[ACK] 06H
LCX-Message x (attempt 1)	→	
	←	[ACK] 06H
LC1-Message 2 (attempt 20)	→	
	←	[NAK] 15H

## Data Transmission



CPM2000/CPM3/CPM2		Automation
Message 3 (attempt 1)	→	
Wait 4 seconds...		No response or anything else than 06H/15H
Message 3 (attempt 2)	→	
Wait 4 seconds...		No response or anything else than 06H/15H
Message 3 (attempt 3)	→	
Wait 4 seconds...		No response or anything else than 06H/15H
Message 3 (attempt 4)	→	
Wait 4 seconds...		No response or anything else than 06H/15H
CPM switch to Manual Mode.		
Heartbeat	→	
Wait 10 or 30 seconds		No response or anything else than 06H/15H
Heartbeat	→	
	←	[ACK]
Message 4 (attempt 1)	→	
	←	[ACK]

## 7.0 Document Revision History

Date	Revision	Author	Changes
November 23,2000	Original	Stephan Frenette	
August 29,2003	V1.40 R D	Stephan Frenette	Added Surtec Protocol
May 05,2005	R141	Tim Lapsley	Updated sections 1.x, 2.x, 3.x. Added ADT pulse extended protocol, Added Automation Command Packet (Time/Date Update) and Responses.
May 12, 2005	R142	Tim Lapsley	Updated Internal Event Section
May 17, 2005	R143	Rey Sacuevo	Updated Modem/SIA automation for 6 – 10 digits.
June 10, 2005	R144	Stephan Frenette	Added Robofon, Outel, Telim/Telenot, CESA, Vonk, Stratel
June 16, 2005	R145	Rey Sacuevo	Updated the Data Flow (Transmission) Table to help clarify CPM to Automation flow.
July 26, 2005	R146	Rey Sacuevo	Updated the internal status message of online timeout from “YB” to “YS”.
Sep 12, 2005	R147	James Li	Added PSU inter-connect cable internal trouble message.
Sept 22,2005	R148	Tim Lapsley	Updated Linecard (DRL2E,DRL3,DRL2000) audio internal messages
Oct 26,2005	R149	James Li	Add status messages for CPM3 taking Over Polling, Switching to Manual mode, Switching to Normal mode and Switching to Standby mode.
February 14, 2006	R150	Tim Lapsley	Updated Compatibility matrix for System II and internal alarms section for System II
March 02,2006	R151	Tim Lapsley	Added DRLx Coldboot printer Internal Status messages.
March 20,2006	R152	Tim Lapsley	Updated Comments for DRL Internal Status messages.
June 5, 2006	R153	Rey Sacuevo	Added SIM number protocol
July 31, 2006	R154	Tim Lapsley	Added Scantronics 8RRLLL descriptions. Updated SG/DMP Additional Information.
Nov 28,2006	R155	Tim Lapsley	Added CPM3 PSC internal messages.
Nov 29,2006	R156	Tim Lapsley	Added SIM Number to protocol list, corrected Secondary CPM3 Failure internal event.
Jan 22, 2007	R157	Omar Edwards	Added description and example of CPM3 internal generated status printer messages, with SIA automation output.
Jan 24, 2007	R158	James Li	Added 3 CPM3 internal messages, “Reset SG-Fallback”, “Option Change” and “Automation Time & Date Update”.

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